

# How to find a good watermist system manufacturer

As with anything you acquire you want to make sure you have a good product. And especially when it comes to fire protection – something that in an emergency shall protect nothing less than lives, properties and jobs – you want to make extra sure that you buy and integrate a system that does the job it is supposed to do. That is why it is beneficial to have some relevant questions (that are and indeed should be frequently asked) at hand to come to the right decision.



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## How do I find the right system for a specific application and how do I know that watermist is a good or even the best choice?

The suitability of any type of active fire protection system must be evaluated with respect to the fire hazard, its associated risks, the agreed scope of the system and

the practical, technical and budgetary constraints of the application.

These details should be defined within a fire strategy prepared by a suitably qualified fire engineer, and the strategy may also recommend suitable types of suppression systems. At Danfoss Fire Safety, we provide full design and guidance to provide the best solution possible, aligned with the fire strategy.

In addition to the performance objectives, the cost of the system may also affect the suitability. With this in mind, it is crucial to consider the Total Cost of Ownership (TCO).

For example, while it is permissible



Image courtesy of Danfoss Fire Safety

to use carbon steel or plastic pipes for sprinkler systems, most watermist systems utilise high-quality, corrosion-resistant stainless-steel pipes and fittings to ensure longer service life. However, for certain hazard types, watermist systems may achieve an equivalent (or higher) level of performance as sprinkler systems, using 60–80% less water than sprinklers. Owing to this lower flow rate, watermist systems tend to use much smaller pipes. Diameters in the range of 10–38mm (3/8–1.5in) are common. Also, owing to mist systems' higher operating pressures, it is possible to supply the entire system from one watermist pump unit, even on the largest or tallest buildings without the need for additional booster pumps. Consequently, this increases the ease and speed of system installation, requires fewer fittings and applies less load onto the building's ceilings, all of which serve to reduce the installation and maintenance costs.

## What must a manufacturer/installer deliver?

From the outset, the deliverable is a complete system designed as a complete solution approved and built to valid and applicable standards in accordance with the manufacturer's Design, Installation, Operation and Maintenance (DIOM) manual. The manufacturer and installer must always select and install products that have been tested in real fires, representative of the application.

The handover of the system to the customer is just the beginning. Depending on the application, the design life of a watermist system can span many years – for example, Danfoss Fire Safety continues to provide spares parts and service support for several of their SEM-SAFE watermist systems, which are more than 30 years old. Akin to all other types of active fire safety system, watermist systems must be routinely inspected and maintained. Consequently, the manufacturer must be equipped to deliver technical support and spare parts throughout the life of the system.

## How do I choose a 'good' watermist system?

We believe the key driver is to work with a supplier who can guide and advise to create an attractive TCO and the best possible fire safety solution in accordance



Image courtesy of Danfoss High-Pressure Pumps

with application's life safety and property protection requirements.

The quality of the system as a whole is dependent upon a combination of factors, including the quality of its components, the quality of the design, quality of installation and the quality (and ease) of maintenance.

A good starting point is to choose a system from a reputable manufacturer, which will be designed and installed by an authorised partner of the equipment manufacturer.

## Where do standards come in? And what standards are there?

Watermist systems were introduced in the 1940s for specific applications such as passenger ferries. Consequently, the International Maritime Organisation's Marine Safety Committee (IMO MSC) developed many of the first international watermist standards, most of which also contain watermist fire test protocols.

▲ Water mist – at least 90 per cent of the droplets must be smaller than 1mm.

The IMO standards are extensive, with fire test protocols for applications ranging from low-hazard public spaces, high-hazard storage spaces, engine rooms, machinery spaces, vehicle decks and for the protection of external balconies.

In the mid-1990s, interest in watermist systems for land-based applications increased, becoming more and more popular as a green alternative to halon, particularly when CFC production was phased-out under the Montreal Protocol in 1987. The NFPA 750 *Standard on Water Mist Fire Protection Systems* was first published. This provided standardised design, installation, maintenance and testing requirements for watermist fire suppression systems in the US. It remains one of the most recognised watermist



Image courtesy of IWMA / Jasmina Ruchmanovic

◀ Lewis Oxley at the 16th International Water Mist Conference in Vienna.

quality assurance. In many cases, third-party inspection is mandated by the AHJs. These can include the local fire authority, building control and the insurer – all of whom may be involved in the inspection and approval of the installation. It is good practice to consult the AHJs at an early stage in the design of the system.

**Are there any applications where watermist is not the right choice?**

Watermist can be the optimal technology when it comes to protecting people, buildings and assets, particularly with respect to the fact that it is suitable for almost all fire classes, including ordinary combustibles, flammable liquids, flammable gases, electrical fires and cooking oils and fats.

As with all fire protection systems, there are limits to its application. Water-based systems including sprinkler and mist systems must not be used for direct application to combustible metals (Class D fires), such as lithium, sodium and potassium.

It is worth noting that this does not preclude the use of watermist for the containment and cooling of lithium-ion battery fires. In fact, this is an application where watermist's low flow rates and high cooling capacity have potential to provide tangible benefits.

The conclusion that can and must be drawn from these answers is that the end customer should put any provider of watermist (as well as other fire suppression and extinguishing) systems to the test. The core message is do not just grab any system from the bargain bin. At the end of the day, many may lose out if decision-makers saved at the wrong end. It would simply be false economy to have everything neat but the fire-protection system. Knocking on more than one door to compare prices is okay, knocking on more than one door to compare competency is even better.

➔ For more information, go to [www.iwma.net](http://www.iwma.net)

standards and is regularly reviewed and updated, typically every four years.

In Europe, standard EN 14972 was approved in 2020. It also covers the design, installation, inspection and maintenance of watermist systems, and contains fire test protocols for a wide range of residential, commercial and industrial applications.

In addition to the US and European standards, other national watermist standards exist. For example, BS 8458 and BS 8489 are the British standards for domestic & residential and commercial & industrial applications, respectively.

**Is there a standard that covers everything or are there situations when standards should be/can be combined?**

NFPA 750 and EN 14972 both cover a wide range of hazards, and where a fire test protocol for a particular hazard does not exist, EN 14972 also provides guidelines for developing representative fire-test protocols, which may include reference tests using a sprinkler system to establish the required performance of the mist system.

Subject to approval by the Authority Having Jurisdiction (AHJ), it may be

acceptable to combine standards. For example, both NFPA 750 and NFPA 502 are applicable to Danfoss SEM-SAFE Vehicle Tunnel systems.

**What type of approvals are there? Which are the approvals to look out for? What are the approval bodies active in the watermist market?**

Broadly, there are product approvals and system approvals.

Product approval is normally performed by third-party approval bodies including FM Approvals, UL Solutions and VdS. The focus is typically the fire testing and component testing of watermist components. Components' Type Approval Certificates can be accessed on several approval bodies' websites, or by contacting the manufacturer.

System approval is normally performed by the relevant AHJs, with reference to the applicable standards, for example EN 14972, NFPA750, etc.

**What is the significance of third-party inspection? Should the end customer insist upon one?**

Third-party inspection of a system design or installation can provide an additional, independent and impartial means of

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